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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/023,163	12/18/2001	Cornelis Leonardus Gerardus Ham	NL000746	4649
24737	7590	10/16/2003	EXAMINER	
PHILIPS INTELLECTUAL PROPERTY & STANDARDS P.O. BOX 3001 BRIARCLIFF MANOR, NY 10510			SHRIVASTAV, BRIJ B	
			ART UNIT	PAPER NUMBER
			2859	

DATE MAILED: 10/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/023,163	Applicant(s) HAM ET AL.	
	Examiner Brij B Shrivastav	Art Unit 2859	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

1. Amendment dated 4 June 2003 in response to Office action dated March 27, 2003, has been received and entered.
2. Applicant's arguments with respect to claims 1-10 have been considered but are moot in view of the new ground(s) of rejection.
3. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Claim Objection

4. Applicant is advised to delete--"to"—in line 1 of each of the claims 2-10. Since it is not required

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morad (US 5,083,085) in view of Stewart C. Bushing; Magnetic Resonance Imaging, pp 148-150, 1996, Mosby-Year Book Inc (hereinafter Bushing).

As regards to claim 1, Morad teaches a magnetic resonance imaging apparatus comprising a gradient coil assembly for generating gradient magnetic fields in an imaging volume (column 1, lines 5-19). Morad also teaches the gradient coil assembly comprising at least three gradient coils for generating three different gradient magnetic fields (column 1, lines 20-28). Further, Moran teaches a conductive element (figure 1, numeral 13) in close proximity to at least one of the gradient coils (figure 1, numerals 12, 14; column 2, lines 24-44) in order to compensate self-induced eddy currents in the gradient coil assembly (column 1, lines 52-58). Morad does not specifically teach each of the gradient coils comprise a pair of coil elements arranged in different planar axis. Bushing teaches an MRI apparatus wherein each of the gradient coils comprising a pair of coil elements arranged in different planar axis (figures 12-4, 12-5, 12-6 and 12-17). It would have been obvious to one of ordinary skill in the art to implement the gradient coil arrangement teaching of Bushing in the gradient coil assembly of Morad to reduce eddy currents so as to improve image quality.

Claims 2 and 3 are further rejected as Moran teaches the presence of a conductive element in side of at least one gradient coil (figure 1, numeral 14, gradient coil, and numeral 13, a conductive element). Moran also teaches a conductive element, which is provided between the inner gradient coils and the outer gradient coils (figure 1, numerals 12-14).

6. Claim 4-6 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morad US 5,083,085) and Bushing as applied to claims 1-3 above, and further in view of Doty (WO 94/01785).

As regards to claims 4-6, neither Morad nor Bushing teaches conductive elements comprising: a) an active or passive coil loop, b) the coil loop is connected to a separate loop amplifier, and c) the loop is electrically shorted. Doty teaches a gradient coil having active and passive coil loops, which are connected to separate amplifiers, and they are also short-circuited (figures 2, 6, 8, numerals 308, 801; 603; 808, 809). It would have been obvious to one of ordinary skill in the art to combine gradient coil arrangement teaching of Doty with the teaching of Morad and Bushing to achieve a gradient coil assembly of reduced eddy currents improving image quality.

As regards to claim 10, neither Morad nor Bushing teach a gradient coil assembly with conductive elements to suppress high order behavior of the gradient coil(s). Doty teaches a gradient coil having conductive element(s) placed near the gradient coils to suppress their high order behavior (pages 33,first paragraph and page 35). It would have been obvious to one of ordinary skill in the art to adapt gradient coil

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teaching of Doty with the teaching of Morad and Bushing to achieve a reduced eddy current gradient coil system improving image quality.

7. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morad (US 5,083,085) and Bushing as applied to claims 1-3 above, and further in view of Mulder et al (WO 00/25146).

As regards to claim 8 and 9, neither Morad nor Bushing teach the conductive element as a conductive pad/plate or a conductive slit. Moulder et al teach an MRI apparatus including a conductive element as a conductive pad/plate/slit. It would have been obvious to one of ordinary skill in the art to use the conductive plate of Moulder et al as the conductive element with the gradient coils of Morad to reduce eddy currents improving image quality.

8. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morad US 5,083,085), Bushing and Doty as applied in claims 4-6 and 10 further in view of Riess et al (US 6,509,555)

ob As regards to claim 7, neither Morad nor Bushing teach conductive element loop being driven by a signal taken from the gradient coil while using it as a transformer. Riess et al teach a hand held induction tool including a conductive element loop as a step-down transformer (figure 5, numeral 202). It would have been obvious to one of ordinary skill in the art to use step-down transformer conductive loop of Riess et al connected to the conductive elements of Morad to have an inexpensive and simple arrangement for gradient coil shielding.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brij B Shrivastav whose telephone number is 703-305-0649. The examiner can normally be reached on 7 AM to 4 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego F.F. Gutierrez can be reached on 703-308-38-7. The fax phone numbers for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-0956.



Bbs

6 October 2003



Diego F. F. Gutierrez

Supervisory Patent Examiner